

## **Draft Feasibility Study Costing Approach Memorandum**

### General Comments:

1. This memorandum uses a cost period of 30 years. There is no justification provided for using a 30-year period in this memorandum. EPA guidance for costing an FS (EPA 2000), which was cited for this document, explicitly states that the costing period should be determined by the time estimated to achieve the Remedial Action Objectives (RAOs). The guidance further states that the blanket use of a 30-year period of analysis is not recommended (sic p.4-2).
2. This document does not include mitigation costs, which are likely to be necessary for most alternative actions. The FS needs to include capital costs, costs for technical and professional services, etc. for mitigation projects.
3. The duration of the project will most likely be determinant upon construction during the fish window. EPA's expectation is to implement the remedy as quickly as possible (within the limits of fish windows) for the purposes of cost estimation. The memorandum should discuss when the fish window for the lower Willamette River is, and the limitations for construction. Further, this will also add to the number of mobilizations/demobilizations that will be required to perform the necessary construction. The number of simultaneous construction projects will also affect cost. These factors should all be considered in costing remedial alternatives in the draft FS.
4. EPA has not had discussions with the LWG regarding AOPC to SMA development. Consequently, we are not sure if we agree with a sub-Sediment Management Area (subSMA) concept at this time.
5. Long-term monitoring commences once the RAOs for the site have been achieved. These are activities to maintain effectiveness of the remedy. The monitoring that occurs from the time construction is complete until the RAOs have been met is termed short-term monitoring. This document does not discuss short-term monitoring costs separately from long-term monitoring costs.
6. Demolition (piers, docks, etc.), piling and debris removal should be costed as a separately under Indirect Construction Tasks (page 2). This will likely be part of many remedies, not just full removal alternatives. It will be a necessary part of capping, CDF construction and possibly in-situ treatment or EMNR.
7. Monitoring costs should include costs for laboratory analysis.
8. There is no discussion of evaluation of net present value or sensitivity analysis that will be conducted in the FS. These are discussed in the EPA FS Costs Guidance and should be discussed in this document as well.
9. Remedial design sampling costs are not included in this document. Since much sampling, including cores, benthic toxicity, and debris investigation, was postponed to this phase of the project, it is likely to be a significant cost of the project and should be included in the analysis.
10. At the next check-in meeting regarding AOPC to SMA development, the LWG should present specific examples of how volumes and unit costs would be calculated and applied for one or two SMAs.

### Specific Comments:

1. Page 1, Introduction. The introduction should acknowledge that the final alternative cost estimates in the feasibility study will be developed to an expected -30%/+50% cost accuracy range and that all cost estimates will be documented to the extent practicable. Cost estimates

for screening-level alternatives should be developed to at least a -50%/+100% expected cost accuracy per EPA guidance.

2. Page 1, pp 2, last sentence. The sensitivity analysis for costing should only be determined from the nature and extent of contamination, remedy failure, expected life of the remedial technology, project duration, and discount rates.
3. Page 1, pp 1. Since the Oregon Department of State Lands is also a Potentially Responsible Party at the site, they may be willing to negotiate the requirement for lease or purchase as part of a negotiation. The LWG should provide justification for any costs submitted in the draft FS with regard to the lease and/or purchase of state lands.
4. Page 2, DSL Land Purchase. DSL will soon be writing rules that specifically address use of State-owned submerged and submersible lands for implementation of removal and remedial actions and certain restoration projects. The rules are expected to describe the type of authorization needed, the process for and cost of securing that authorization and other requirements related to long-term maintenance and monitoring. The rules will most likely include requirements for conservation easements on the ENMR lands that would include or facilitate restrictions needed to facilitate the remedy. Where other short- or long-term access is needed to facilitate work or permanent structures, other authorizations would be required. Depending on the nature of the project, these may include an access agreement, lease, easement agreement, sale of the property, or a combination thereof. The costs proposed for such authorizations would be determined by DSL, as provided in the new rules. DSL's existing rules value a conservation easement at one-third of the adjacent upland value. In earlier transactions for remedial work, DSL has established a lease rate based on non-marine use rates in effect at the time as applied under OAR 141-082 and a purchase price based on capitalizing that lease rate over ten years. New rules developed and adopted by the State Land Board may, however, differ from those in place now and would supersede existing rules and past practice.
5. Page 2, Indirect Construction Tasks. Design should be a capital cost, which is a direct cost, not an indirect cost. It is inappropriate to apply 15% since the EPA FS Costing Guidance (page 5-13) applies 6% to remedies costing >\$10M.
6. Page 2, Indirect Construction Tasks. Cost assumptions should also include contractor overhead & profit, legal, mobilization & demobilization for each construction period, and institutional controls. Contingency costs should be separated into scope & bid: scope usually ranges between 10 and 25%, where bid usually ranges between 10 and 20%. Justification for the use of 40% total contingency should be provided. The fish window construction period should be well defined for this cost assumption and should assume that the construction periods will commence back to back (no lapse in years during construction).
7. Page 3, Quantity Estimates, 3<sup>rd</sup> bullet. While "chasing contamination" has been shown to be largely ineffective, some of that ineffectiveness has been the result of poorly conceived and executed dredging plans. Dredge sequencing can be critical and has yet to be adequately addressed (beyond it's a good thing to consider). Once a dredge plan is prepared, the issue of dredging passes can be rationally evaluated and resolved. At this time it is too early to accept a NO MULTIPLE PASSES approach entirely. For FS costing purposes, a two-dredge-pass estimate should be used.
8. Page 4, Monitored Natural Recovery. There is no justification or statistical significance to the number of samples assumed for the site-wide monitoring program. The values presented will likely far underestimate the cost of the monitoring program required to establish MNR has occurred to meet the RAOs for the site.
9. Page 4, Monitored Natural Recovery, 1<sup>st</sup> bullet. The term "harbor-wide" should be "site-wide" to clearly define that the monitoring will associated with contamination throughout the

superfund site. The site-wide monitoring program needs to extend to the duration of time that it will take to meet RAOs at the site. This will likely change with remedial alternatives since MNR will have a different time frames when combined with other actions. It should be assumed that all monitoring (biota, surface water, and sediments) will occur twice every five years (i.e., second and fourth year) for at least first 10 years or for the duration of construction at the site, and then could drop off to once per five years (i.e., fourth year) until RAOs are met. Biota tissue monitoring should include 21 composites; however, EPA agrees with the assumption of four species (e.g., carp, bass, sculpin and clams). Surface sediment should be assumed to be 24 multi-increment samples consisting of 30-50 increments per sample (excluding capped areas).

10. Page 4, Monitored Natural Recovery, 2<sup>nd</sup> bullet. The term “site-specific” should be “area-specific” to clearly define that the monitoring will be associated with contamination in an area of the superfund site. The area-specific monitoring program needs to extend to the duration of time that it will take to meet RAOs in that area. This will likely change with remedial alternatives since MNR only will have a different time frames when combined with other actions. Surface sediments should be assumed to be one multi-increment sample per acre consisting of 30 increments per sample (excluding capped areas). Three surface water transects in area-specific location should be added to the costs estimate. It should be assumed that all monitoring will occur twice every five years (i.e., second and fourth year) for at least first 10 years or for the duration of construction at the site, and then could drop off to once per five years (i.e., fourth year) until RAOs are met.
11. Page 4, Enhanced Monitored Natural Recovery, 3<sup>rd</sup> bullet. Turbidity monitoring will be required at a minimum during material placement.
12. Page 4, Enhanced Monitored Natural Recovery. Monitoring for enhanced natural recovery should be similar to that of monitored natural recovery (see comments 8 through 11).
13. Page 5, Capping. Costs for the transport, storage and placement of cap materials should be included. Long-term monitoring should include biological monitoring (biota tissue) as well.
14. Page 5, Capping. Direct costs for materials should be split into engineered caps (armored caps) and reactive (rather than active) caps. The difference in cost is only the addition of the reactive layer. The use of organoclay mats is expensive and may not always be warranted. Granulated Active Carbon (GAC) can be equally effective in controlling many contaminants as a reactive layer in a cap.
15. Page 5, Capping. Long-term O&M does not commence until after RAOs are achieved. This document should discuss short-term O&M that will occur after construction complete until RAOs are achieved. Short-term O&M should consider labor, equipment and materials (at net present value) for monitoring and periodic costs of 5 year reviews, site closeout, remedy failure/replacement (based on life expectancy of technology) and replacement/repair of cap. The cap-specific monitoring program needs to extend to the duration of time that it will take to meet RAOs in that area for each remedial action alternative. Surface sediments of cap should be assumed to be one multi-increment sample per acre consisting of 30 increments per sample. It should be assumed that all monitoring will occur twice every five years (i.e., second and fourth year) for at least first 10 years or for the duration of construction at the area, and then could drop off to once per five years (i.e., fourth year) until RAOs are met.
16. Page 5, Capping, 1<sup>st</sup> and 2<sup>nd</sup> bullets. Collection of sediment cores, pore water, and hydrographic surveys should be part of short-term O&M costs, as well as long-term O&M costs. Long-term monitoring should include diver surveys and hydrographic surveys once every 10 years. Sediment cores and surface sediment monitoring should only occur when catastrophic events occur (e.g., extreme flow events, earthquake, cap disruption from boat anchors, etc.).
17. Page 5, Active Capping. Comments 13 through 16 also apply to this section.

18. Page 6, Full Removal. The fish window construction period should be well defined for this cost assumption and should assume that the construction periods will commence back to back (no lapse in years during construction). Short-term O&M should consider labor, equipment and materials (at net present value) for monitoring and periodic costs of 5 year reviews, and site closeout.
19. Page 6, Full Removal. The cost should include decontamination of work equipment (trucks, barges, boats, dredges, etc.) and all other items that may come in contact with the contaminated sediment. Land acquisition/leasing/rental costs for staging equipment should be considered.
20. Page 6, Full Removal, 2<sup>nd</sup> bullet. Not all pilings or floating docks will need to be replaced; replacement costs should not be part of the cost analysis. Further, there should be some costs for removal of more permanent-type structures such as piers and docks.
21. Page 6, Full Removal, 3<sup>rd</sup> bullet. A more robust analysis of engineering controls should be considered than partial-height silt curtains. The costs should include the methods described in the "Dredging Water Quality Evaluations" FS Tools Technical Memorandum to determine appropriate and necessary engineering controls for dredging. At a minimum, the draft FS needs to consider the cost of rigid containment as a possible work/cost element of dredging in some areas.
22. Page 6, Full Removal, 5<sup>th</sup> bullet, last sub-bullet. Second pass dredging may not be required just because the residuals are elevated. It would depend on the mass of elevated residuals and whether EMNR would or would not be expected to work.
23. Page 7, Full Removal, long-term O&M. There should only be long-term O&M associated with full removal where contamination is left in place. If all targeted contamination for full removal is able to actually be removed, then there is no need to conduct long-term O&M. This area would become part of the site-wide MNR area post removal. For areas where contamination is left at depth and a cap is required, refer to comments 13 through 16 for appropriate assumptions.
24. Page 7, In-Situ Treatment. In-situ treatment is presented as "placing sand mixed with carbon as a thin layer over impacted sediment." It may also be appropriate to mix carbon directly into the existing sediment. The material cost differential could be significant over large areas and should be considered in the draft FS.
25. Page 7, In-Situ Treatment. Land acquisition/leasing/rental costs for staging equipment should be included. Long-term monitoring should include biological monitoring (biota tissue) as well.
26. Page 7, In-Situ Treatment. Long-term O&M does not commence until after RAOs are achieved. This document should discuss short-term O&M that will occur after construction complete until RAOs are achieved. Short-term O&M should consider labor, equipment and materials (at net present value) for monitoring and periodic costs of 5 year reviews, site closeout, and remedy failure/replacement (based on life expectancy of technology). The area-specific monitoring program needs to extend to the duration of time that it will take to meet RAOs in that area for each remedial action alternative. Surface sediments of cap should be assumed to be one multi-increment sample per acre consisting of 30 increments per sample. It should be assumed that all monitoring will occur twice every five years (i.e., second and fourth year) for at least first 10 years or for the duration of construction at the area, and then could drop off to once per five years (i.e., fourth year) until RAOs are met. Once RAOs are met, area can be made part of site-wide MNR program.
27. Page 8, Disposal. Pretreatment and treatment costs for contaminated sediment and water (from dewatering) should be included.
28. Page 8, Disposal, 5<sup>th</sup> bullet. The cost estimate for disposal is based on transport to the landfill by train. Would barging the material be more cost effective? Transportation costs for rail and

barge should be evaluated with rehandling requirements specified, and tipping fees to landfills need to be part of the cost estimate.

29. Page 8, Disposal, 2<sup>nd</sup> to last paragraph. Please clarify what is meant by “The lower end of the Terminal 4 CDF is assumed to be the lower possible end of in-water CDF disposal.”
30. Page 8, Disposal, last paragraph. This statement is vague and needs more explanation of assumptions that will be used to provide FS cost estimates.
31. Page 8, Ex-situ Treatment. It should also be considered that treated material may be used as cap material and could reduce cost of capping material or could be sold to offset cost of treatment.
32. Page 9, References. The following additional sources of information should be used:
  - Chapter 6 Equations from USACE ERDC/EL TR-08-29 “Technical Guidelines for Environmental Dredging of Contaminated Sediments.” This guide would be helpful to state assumptions for each dredge production rate.
  - EPA 905-R96-001 “Estimating Contaminant Losses from Components of Remediation Alternatives for Contaminated Sediment” to supplement the information cited from Patmont and Palermo.
33. Figure 1, Armored Caps. Figure 1 shows various types of armored (only) caps. The LWG should recognize that armored caps may not be appropriate or acceptable given certain site-specific habitat issues and may need to be modified under mitigation costs. This comment also applies to the cap costing assumptions on page 5.
34. Figures 1 & 2, Vertical Overplacement. Figures 1 & 2 show assumptions for vertical overplacement of cap material & dredging over-depth, respectively. Assumptions for horizontal overplacement of cap materials (e.g., fringe capping or feathering) & lateral over-dredging should also be presented.